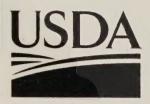
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United States Department of Agriculture Agricultural Research Service

**Agricultural Research Service Report** 

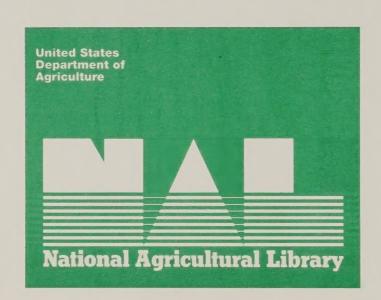
February 2000

## Economic Impact of the Russian Wheat Aphid and Greenbug in the Western United States 1993-94, 1994-95, and 1997-98



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## Introduction

The information contained in this report is the result of ongoing surveys of the economic impact of the Russian wheat aphid and greenbug in small grains. The report contains information from contributing states. The reporting format for 1994 and 1995 is consistent with that used in reports from earlier years. An abbreviated reporting format is used for 1998. Since not all states in which the two aphids are economic pests of small grains contributed information in all years, therefore the report is incomplete in its estimates of total economic impact. However, since detailed economic impact data were collected on the Russian wheat aphid each year from 1986 through 1993, this report contributes to that previous body of information, and to a similar, but smaller data base on economic impact of the greenbug. These surveys are important because they provide knowledge that is needed by decision makers at the research, administrative, and congressional levels.

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Russian Wheat Aphid: 1993 - 94



Table 1. Wheat, barley, and other small grain acreage in Russian wheat aphid-infested areas in the western United States: 1994.

State		Dryland Wheat	Irrigated Wheat	Spring Wheat	Barley	Other Small Grains
Arizona	State acreage planted Acres in RWA-infested areas	0	0	122,000	33,000	0
Colorado	State acreage planted	2,765,000	135,000	45,000	000'06	000'86
	Acres in RWA-infested areas	2,730,000	135,000	45,000	000'06	98,000
Idaho	State acreage planted	425,000	415,000	650,000	740,000	0
	Acres in RWA-infested areas	400,000	400,000	000'009	000'009	
Kansas	State acreage planted	11,365,000	735,000	0	20,000	0
	Acres in RWA-infested areas	4,360,000	490,000		10,000	
Montana	State acreage planted	2,600,000	27,500	2,742,000	2,100,000	162,500
	Acres in RWA-infested areas	0	0	0	0	0
Nebraska	State acreage planted	2,117,000	83,000	0	35,000	0
	Acres in RWA-infested areas	802,100	43,900		16,000	
North Dakota	State acreage planted	35,000	0	000,000,6	2,600,000	3,200,000
	Acres in RWA-infested areas	000'9		175,000	38,000	2,000
Oklahoma	State acreage planted	7,015,000	160,000	0	0	0
	Acres in RWA-infested areas	600,500	135,500			
Oregon	State acreage planted	800,000	100,000	000'59	140,000	0
	Acres in RWA-infested areas	000'699	100,000	26,000	131,000	
Texas	State acreage planted	5,065,000	935,000	0	20,000	0
	Acres in RWA-infested areas	1,670,000	870,000		2,000	
Washington	State acreage planted	2,400,000	0	250,000	310,000	45,000
	Acres in RWA-infested areas	2,000,000		245,000	305,000	30,000
Total acreage		34,587,000	2,590,500	12,874,000	6,088,000	3,505,500
Total in RWA areas		13,237,600	2,174,400	1,177,000	1,207,570	108,000

Table 2. Estimates of acres treated and cost of treatment for Russian wheat aphid in the western United States: fall 1993 and spring and summer 1994

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		Winter Wheat	vnear										
									S	Small	Treat	Treatment	Total cost
	Dryland	and	Irrig	Irrigated	Spring Wheat	Wheat	Barley	ley	5	Grains	cost	cost/acre	per state
State	aerial	ground	aerial	ground	aerial	ground	aerial	ground	aerial	ground	aerial	ground	
Arizona					4,000	0	2,000	0			\$11.00	N/A	\$66,000
Colorado	380,000	20,000	0	0	0	0	20,000	0	0	0	\$10.50	\$5.25	\$4,462,500
Idaho	71,000	71,000	0	0	0	0	4,000	0			\$12.00	\$12.00	\$1,752,000
Kansas	15,000	0	0	0			0	0			\$8.45	N/A	\$126,750
Montana	0	0	0	0	0	0	0	0	0	0	N/A	N/A	0
Nebraska	0	0	0	2,000			0	0			\$9.75	\$9.25	\$18,500
North Dakota	0	0			0	0	0	0	0	0	A/A	N/A	0
Oklahoma	51,000	0	19,000	0							\$9.15	N/A	\$640,500
Oregon	12,222	0	0	0	15,052	0	9,221	0			\$7.00	N/A	\$255,465
Texas	110,000	7,000	80,000	7,000			200	0			\$8.20	\$8.05	\$1,674,800
Washington	50,000	0			10,000	0	0	0	0	0	\$8.00	N/A	\$480,000
Totals	689,222	128,000	000'66	9,000	29,052	0	35,721	0	0	0	_		\$9,476,515

Table 3. Losses in dryland winter wheat attributed to Russian wheat aphid: 1994

State	Infested acres harvested	Yield per acre (bu)	Total yield (bu)	% yield reduction	Yield losses (bu)	Value per bu	Total loss
Arizona							0
Colorado	000'059	31	20,150,000	10	2,015,000	\$3.12	\$6,286,800
Idaho	400,000	37	14,800,000	-	148,000	\$3.90	\$577,000
Kansas	4,108,000	35	143,780,000	0	0		0
Montana	0						0
Nebraska	754,000	35	26,407,500	0.1	26,410	\$3.20	\$84,504
North Dakota	0						0
Oklahoma	734,200	29	21,291,800	15	3,193,770	\$3.10	\$9,990,687
Oregon	25,000	56	1,400,000	2	28,000	\$4.00	\$112,000
Техаѕ	594,000	28	16,632,000	ဖ	997,920	\$3.05	\$3,043,656
Washington	2,000,000	54	108,000,000	0.5	540,000	\$4.10	\$2,214,000
Totals	9,265,700		352,443,800		6,949,080		\$22,308,647

Table 4. Losses in irrigated winter wheat attributed to Russian wheat aphid: 1994

State	Infested acres	Yield per	Total	% yield	Yield loceae (hii)	Value	Total
Arizona		(50)	(pa) plaif		(82) 5555	5	0
Colorado	35,000	62	2,170,000	0	0	\$3.12	0
Idaho	400,000	115	46,000,000	-	460,000	\$3.90	\$1,794,000
Kansas	480,000	52	24,960,000	0	0		0
Montana	0						0
Nebraska	37,200	55	2,046,000	0	0	\$3.20	0
North Dakota							0
Oklahoma	135,500	59	7,994,500	15	119,175	\$3.10	\$3,717,443
Oregon	2,000	100	500,000	-	5,000	\$4.00	\$20,000
Texas	000'969	55	38,280,000	4	1,531,200	\$3.05	\$4,670,160
Washington							0
Totals	1,788,700		121,950,500		3,195,375		\$10,201,603

Table 5. Losses in spring wheat attributed to Russian wheat aphid: 1994

State	Infested acres harvested	Yield per acre (bu)	Total yield (bu)	% yield reduction	Yield losses (bu)	Value per bu	Total loss
Arizona	26,000	92.5	5,180,000	0	0	\$3.90	0
Colorado	4,500	82	369,000	0	0	\$3.12	0
Idaho	000'009	75	45,000,000	_	450,000	\$3.55	\$1,597,500
Kansas							0
Montana	0						0
Nebraska							0
North Dakota	0						0
Oklahoma							0
Oregon	22,000	38	836,000	4	33,440	\$4.00	\$133,760
Texas							0
Washington	305,000	47	14,335,000	0.5	71,675	\$4.30	\$308,203
Totals	987,500		65,720,000		555,115		\$2,039,463

Table 6. Losses in barley attributed to Russian wheat aphid: 1994

	Infested acres	Yield per	Total	% yield	Yield	Value	Total
Arizona	narvested 12,570	acre (bu)	yield (bu) 1,194,150	reduction 0	losses (pn)	\$2.60	0 ssol
Colorado	25,000	82	2,050,000	5	102,500	\$2.72	\$278,800
Idaho	600,000	06	54,000,000	-	540,000	\$1.92	\$1,036,800
Kansas	0						0
Montana	0						0
Nebraska	0						0
North Dakota	0						0
Oklahoma							0
Oregon	11,000	65	715,000	2	14,300	\$1.95	\$27,885
Texas	2,000	40	80,000	2	1,600	\$1.83	\$2,928
Washington	305,000	47	14,335,000	0.5	71,675	\$1.95	\$139,766
Totals	955,570		72,374,150		730,075		\$1,486,179

Russian Wheat Aphid: 1994 - 95



Table 1. Wheat, barley, and other small grain acreage in Russian wheat aphid-infested areas in the western United States: 1995. Parenthetical numbers indicate percentage of Russian wheat aphid-infested acres.

	Winter Wheat	/heat			
					Other Small
State	Dryland	Irrigated	Spring Wheat	Barley	Grains
Colorado	2,765,000 (100)	145,000 (100)	40,000 (25)	110,000 (27.3)	110,000 (81.8)
Idaho	500,000 (100)	290,000 (100)	650,000 (100)	740,000 (100)	170,000 (100)
Kansas	10,900,000 (2.75)	800,000 (2.5)	0	0	0
Montana	1,713,000 (31.5)	30,000 (10.3)	3,450,000 (9.4)	1,300,000 (25.2)	0
Nebraska	2,053,000 (38.3)	97,000 (55.2)	0	8,000 (42.5)	0
New Mexico	307,700 (100)	156,300 (100)	<10,000 (0)	<7,000 (0)	<10,000 (0)
North Dakota	0	0	0	0	0
Oklahoma	6,740,000 (12.2)	160,000 (90.6)	0	6,000 (25)	0
Washington	2,400,000 (41.7)	0	250,000 (50)	310,000 (32.3)	45,000 (0)

Table 2. Estimates of acres treated and cost of treatment for Russian wheat aphid in the western United States: 1995

Winter Wheat

	Total cost	per state		\$2,420,000	0	0	\$22,000	\$37,400	\$186,500	0	\$117,000	\$315,000
	ment	acre	ground	A A A	A/A	N/A	\$10.50	\$9.35	\$9.75	A'N	A/A	\$9.00
	Treatment	cost/acre	aerial	\$11.00	N/A	N/A	\$11.00	A N	\$10.75	N/A	\$11.00	\$9.00
	Small	Grains	aerial ground	0	0				0			0
	S.	<u>S</u>	aerial	0	0				0			0
		Barley	aerial ground	0	0		0	0	0		0	0
		Ba	aerial	0	0		0	0	0		0	0
		Wheat	ground	0	0		0		0			2,000
		Spring	aerial groun	0	0		0		0			25,000
		Irrigated	ground	0	0	0	0	0	4,000		0	
מונים ו		Irrig	aerial	0	0	0	0	0	000'9		0	
The Allege		nd	ground aerial ground	0	0	0	0	4,000	3,000		0	0
		Dryland	aerial	220,000	0	0	2,000	0	2,000		10,700	2,000
			State	Colorado	Idaho	Kansas	Montana	Nebraska	New Mexico	North Dakota	Oklahoma	Washington

Table 3. Losses in dryland winter wheat attributed to Russian wheat aphid: 1995

State	Infested acres	Yield per	Total	% yield	Yield loceae (hii)	Value	Total
Colorado	2,565,000	38	97,470,000	0	0	\$4.60	0
Idaho	200,000	52.1	26,050,000	0	0	\$3.60	0
Kansas	232,000	38	8,816,000	0	0	\$4.55	0
Montana	539,300	31	16,718,300	_	167,183	\$4.25	\$710,528
Nebraska	193,000	34	6,562,000	_	65,620	\$4.50	\$295,290
New Mexico	85,500	6.4	547,200	-	5,472	\$4.40	\$24,077
North Dakota							0
Oklahoma	463,000	20.8	9,630,400	0	0	\$4.35	0
Washington	1,000,000	54	54,000,000	0.5	270,000	\$3.95	\$1,066,500

Table 4. Losses in irrigated winter wheat attributed to Russian wheat aphid: 1995

	Infested acres	Yield per	Total	% yield	Yield	Value	Total
State	harvested	acre (bu)	yield (bu)	reduction	losses (bu)	per bu	loss
Colorado	135,000	62	8,370,000	0	0	\$4.60	0
Idaho	290,500	106.2	30,851,100	0	0	\$3.85	0
Kansas	19,000	52	988,000	0	0	\$4.55	0
Montana	3,100	58	179,800	0	0	\$4.25	0
Nebraska	52,000	63.4	3,296,800	0	0	\$4.50	0
New Mexico	64,500	42.7	2,754,150		27,542	\$4.40	\$121,183
North Dakota							0
Oklahoma	107,000	29	3,103,000	0	0	\$4.35	0
Washington							0

Table 5. Losses in spring wheat attributed to the Russian wheat aphid: 1995

	Infested acres	Yield per	Total	% yield	Yield	Value	Total
State	harvested	acre (bu)	yield (bu)	reduction	losses (bu)	per bu	loss
Colorado	19,500	70	1,365,000	0	0	\$4.45	0
Idaho	650,000	70	45,500,000	0	0	\$3.70	0
Kansas							0
Montana	324,500	65	21,092,500	0	0	\$4.40	0
Nebraska							0
New Mexico							0
North Dakota							0
Oklahoma							0
Washington	115,000	40	4,600,000	4	184,000	\$3.95	\$726,800

Table 6. Losses in barley attributed to Russian wheat aphid: 1995

	Infested acres	Yield per	Total	% yield	Yield	Value	Total
State	harvested	acre (bu)	yield (bu)	reduction	losses (pn)	per bu	SSOI
Colorado	28,500	100	2,850,000	0	0	\$3.05	0
Idaho	740,000	75	55,500,000	0	0	\$2.40	0
Kansas							0
Montana	326,900	75	24,517,500	0	0	\$2.51	0
Nebraska	2,700	41	110,700	0	0	\$2.15	0
New Mexico							0
North Dakota							0
Oklahoma	700	30	21,000	0	0	\$2.20	0
Washington	100,000	47	4,700,000	0.3	14,100	\$2.00	\$28,200

Table 7. Losses in other small grains attributed to Russian wheat aphid: 1995

	Infested acres	Yield per	Total		Yield	Value	Total
State	harvested	acre (bu)	yield (bu)		reduction losses (bu)	per bu	loss
Colorado	85,500	55	4,702,500		0	\$2.05	0
Idaho	170,000	56	9,520,000	0	0		0
Kansas							0
Montana							0
Nebraska							0
New Mexico							0
North Dakota							0
Oklahoma							0
Washington	45,000	58	2,610,000	0	0	\$1.30	0



**Greenbug: 1994 - 95** 



Table 1. Wheat, barley, and other small grain acreage in Greenbug-infested areas in the western United States: 1995. Parenthetical numbers indicate percentage of Greenbug-infested acres.

	Winter Wheat	Wheat			Other Small	
State	Dryland	Irrigated	Spring Wheat	Barley	Grains	Sorghum
Colorado	2,765,000 (0)	145,000 (0)	40,000 (0)	110,000 (0)	110,000 (0)	0
Idaho	500,000 (100)	290,000 (100)	650,000 (100)	740,000 (100)	170,000 (100)	0
Kansas	10,900,000 (2.78)	800,000 (5.3)	0	0	0	0
Montana	1,713,000 (0)	30,000 (0)	3,450,000 (0)	1,300,000 (0)	0	0
Nebraska	2,053,000 (0.5)	97,000 (1.03)	0	8,000 (0)	0	980,000 (61.2)
New Mexico	307,700 (100)	156,300 (93.6)	<10,000 (0)	<7,000 (0)	<10,000 (0)	0
North Dakota	50,000 (0)	0	9,300,000 (0)	2,700,000 (0)	3,400,000 (0)	0
Oklahoma	6,740,000 (93.3)	160,000 (99.7)	0	6,000 (100)	0	350,000 (86)
Washington	2,400,000 (0)	0	250,000 (0)	310,000 (0)	45,000 (0)	0

Table 2. Estimates of acres treated and cost of treatment for Greenbug in the western United States: 1995

		Winter Wheat	Wheat						ď	Cmoll	Troot	Treatment	Total cost
	Dryland	and	Irrig	Irrigated	Spring Wheat	Wheat	Ba	Barley	Gra	Grains	cost	cost/acre	per state
State	aerial	ground	aerial	ground	aerial	aerial ground	aerial	aerial ground	aerial	aerial ground	aerial	ground	
Colorado	0	0	0	0	0	0	0	0	0	0	A/A	A/N	0
Idaho	0	0	0	0	0	0	0	0	0	0	N/A	N/A	0
Kansas	100,000	10,000	0	0							\$9.10	\$8.35	\$993,500
MontaN/A	0	0	0	0	0	0	0	0			N/A	N/A	0
Nebraska	0	0	0	0			0	0	30,000	000'09	\$15.85	\$10.11	\$1,254,300
New Mexico	0	0	2,500	2,500	0	0	0	0	0	0	\$10.75	\$9.75	\$512,250
North Dakota	0	0	0	0	0	0	0	0	0	0	\$6.00	\$3.50	0
Oklahoma	10,700	0	0	0			0	0			\$11.00	N/A	\$117,700
Washington	0	0	0	0	0	0	0	0	0	0	N/A	N/A	0

Table 3. Losses in dryland winter wheat attributed to Greenbug: 1995

State	Infested acres harvested	Yield per acre (bu)	Total vield (bu)	% yield reduction	Yield losses (bu)	Value per bu	Total loss
Colorado	0						0
Idaho	400,000	52.1	20,840,000	0.5	104,200	\$3.60	\$375,120
Kansas	263,000	38	9,994,000	သ	499,700	\$4.55	\$2,273,635
Montana							
Nebraska	10,000	40.9	409,000	0	0	\$4.50	0
New Mexico	85,500	6.4	547,200	0	0	\$4.40	0
North Dakota							0
Oklahoma	4,870,500	20.8	101,306,400	0	0	\$4.35	0
Washington							0

Table 4. Losses in irrigated winter wheat attributed to Greenbug: 1995

State	Infested acres harvested	Yield per acre (bu)	Total yield (bu)	% yield reduction	Yield losses (bu)	Value per bu	Total loss
	0						0
	290,500	106.2	30,851,100	0	0	\$3.85	0
	39,800	52	2,069,600	5	130,480	\$4.55	\$47,083,400
							0
	1,000	63.4	63,400	0	0	\$4.50	0
New Mexico	54,500	42.7	2,327,150	0	0	\$4.40	0
North Dakota							0
	119,000	29	3,451,000	0	0	\$4.35	0
Washington							0

Table 5. Losses in spring wheat attributed to Greenbug: 1995

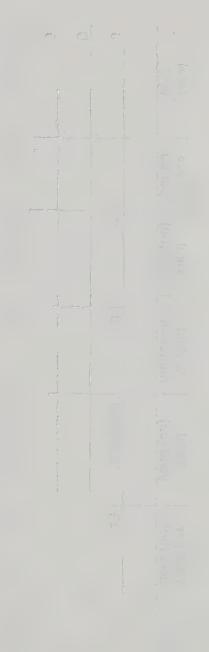
State	Infested acres harvested	Yield per acre (bu)	Total vield (bu)	% yield reduction	Yield losses (bu)	Value per bu	Total loss
							0
	000'059	70	45,500,000	0	0	\$3.70	0
							0
							0
							0
New Mexico							0
North Dakota							0
Oklahoma							0
Washington							0

Table 6. Losses in barley attributed to Greenbug: 1995

	Infested acres	Yield per	Total	% yield	Yield	Value	Total
State	harvested	acre (bu)	yield (bu)	reduction	losses (pn)	per pu	SSO
Colorado							0
Idaho	740,000	75	55,500,000	0	0	\$2.40	0
Kansas							0
Montana							0
Nebraska							0
New Mexico							0
North Dakota							0
Oklahoma	3,000	30	000'06	0	0	\$2.20	0
Washington		٠.					0

Table 7. Losses in other small grains attributed to Greenbug: 1995

18 81	Infested acres Yield per Total % yield Yield Value Total harvested acre (bu) yield (bu) reduction losses (bu) per bu loss	 170,000 56 9,520,000 0 0 0	0	0	600,000 80 48,000,000 5 2,400,000 \$3.08 \$7,392,000	0	0	233,900 34.8 16,279,440 0 0 \$5.90 0	
	(ma) 0:05				80			34.8	



Russian Wheat Aphid: 1997 - 98



Table 1. Economic impact of the Russian wheat aphid on dryland winter wheat in reporting states, 1997-1998 growing season.

State	Infestation	Co	Counties where:	re:	Acres	Acres in Acres	Acres	% yield Acres	Acres
	severity				Planted	infested	infested	loss	treated
	rating					area			
		Crop	RWAs	Economic					
		Planted	Detected Losses	Losses					
California	NA	0	NA AN	NA	0	0 NA	NA	NA	no info.
Colorado	none	37	3	0	2,690,000 218,000	218,000	0	0	no info.
Kansas	none	105	0	0	10,091,000	0	0	0	no info.
Montana	low	48	22	0	1,414,000	0	0	0	no info.
North Dakota	none	27	0	0	70,000	0	0	0	no info.
Nebraska	low	47	12	2	1,800,000	460,000	46,000	90.0	no info.
Oklahoma	low	77	4	_	5,400,000	280,000	28,000	0.01	no info.
Wyoming	low		!	-	230,000	230,000   230,000   230,000   2.0	230,000	2.0	1,000

Acres in infested area = (# counties where RWAs detected / # counties where

crop planted) x acres planted

Acres infested = Acres in infested area x C1.

% **Yield loss** =  $((Acres infested \times C2) / acres planted)) \times 100$ 

The Constants C1 and C2 are:

C2	00.0	0.025	0.05	0.10
C1	0.00	0.10	0.50	1.00
Rating	none	low	moderate	severe

Table 2. Economic impact of the Russian wheat aphid on irrigated winter wheat in reporting states, 1997-1998 growing season.

State	Infestation	Co	Counties where:	re:	Acres	Acres in   Acres	Acres	% yield   Acres	Acres
	severity				Planted	infested	infested	loss	treated
	rating					area			
		Crop	RWAs	Economic					
		Planted	Detected	Losses					
California	AN	0	NA	NA	0	NA AN	AA	NA	AN AN
Colorado	none	26	0	0	160,000	0	0	0	no info.
Kansas	none	43	0	0	000,609	0	0	0	no info.
Montana	low	39	5		33,000	4,200	420	0.03	no info.
North Dakota	AN	0	NA	NA	0	NA AN	NA	NA	no info.
Nebraska	none	18	6	0	100,000	50,000	0	0	no info.
Oklahoma	low	14	4	0	120,000	34,000	3,400	0.07	no info.
Wyoming	no info.	no info.	no info.	no info.	no info.	no info.	NA	NA	AN

Acres in infested area = (# counties where RWAs detected / # counties where

crop planted) x acres planted

Acres infested = Acres in infested area x C1.

% Yield loss = ((Acres infested x C2) / acres planted)) x 100

The Constants C1 and C2 are:

C2	0.00	0.025	0.05	0.10
C1	0.00	0.10	0.50	1.00
Rating	none	low	moderate	severe

Table 3. Economic impact of the Russian wheat aphid on spring wheat in reporting states, 1997-1998 growing season.

State	Infestation	S	Counties where:	re:	Infestation Counties where: Acres Acres in Acres Wyield Acres	Acres in	Acres	% yield   Acres	Acres
	severity				Planted	infested	infested	loss	treated
	rating					area			
		Crop	RWAs	Economic					
		Planted	Detected   Losses	Losses					
California	low	33	25	0	670,000	507,000	50,750	0.2	NA
Colorado	none	17	1	0	70,000	4,100	0	0	no info.
Kansas	NA	0	NA	NA	0	AN AN	AA	NA A	NA NA
Montana	low	52	22	no info.	4,640,000	1,900,000 190,000		0.1	no info.
North Dakota	none	53	0	0	8,800,000	0	0	0	no info.
Nebraska	NA	0	NA	NA	0	AN	NA	NA A	NA
Oklahoma	NA	0	NA	NA	0	NA AN	AA	NA	AN
Wyoming	no info.	no info.	no info.	no info.	no info.	no info.	AN	NA	AN

Acres in infested area = (# counties where RWAs detected / # counties where

crop planted) x acres planted

Acres infested = Acres in infested area x C1.

% **Yield loss** = ((Acres infested x C2) / acres planted)) x 100

The Constants C1 and C2 are:

C2	00.00	0.025	0.05	0 10
C1	0.00	0.10	0.50	1.00
Rating	none	low	moderate	severe

Table 4. Economic impact of the Russian wheat aphid on barley in reporting states, 1997-1998 growing season.

Ottotodiam   Acres   Acres   Acres   Acres   Ottotodiam   Acres   Ottotodiam   Acres   Ottotodiam   Acres   Ottotodiam   Acres   Ottotodiam   Ottoto	Infortation !	(	die ocitari		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	- C. C. C. C.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	10 10 10 VO	0000
State	Infestation	3	Counties where:	<u>n</u>	Acres	Acres III   Acres	Acres	% yield	ACIES
	severity				Planted	infested	infested	loss	treated
	rating					area			
		Crop	RWAs	Economic					
		Planted	Detected   Losses	Losses					
California	low	33	25	0	220,000	167,000 16,700		0.19	NA
Colorado	low	27	4	0	95,000	15,200	1,520	0.04	no info.
Kansas	none	no info.	0	0	10,000	0	0	0	NA
Montana	low	54	14	no info.	1,300,000	337,000	33,700	90.0	no info.
North Dakota	none	53	0	0	2,400,00	0	0	0	AN
Nebraska	low	8	5	2	10,000	6,250	625	0.16	NA
Oklahoma	NA	0	0	0	0	NA	NA	NA	NA
Wyoming	1	-	1	-	105,000	105,000		2.0	NA

Notes:

Acres in infested area = (# counties where RWAs detected / # counties where

crop planted) x acres planted

The Constants C1 and C2 are:

Rating	C1	C2
none	0.00	0.00
low	0.10	0.025
moderate	0.50	0.05
severe	1.00	0.10

**Greenbug: 1997 - 98** 



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Table 1. Economic impact of the Greenbug on dryland winter wheat in reporting states, 1997-1998 growing season.

State Infestation Counties where: Acres Acres in Acres Wyield Acr	Infestation	O	Counties where:		Acres	Acres in	Acres	% yield	Acres
	severity				Planted	infested	infested	loss	treated
	rating					area			
		Crop	Greenbugs	Economic					
		Planted	Detected	Losses					
California	AN	0	NA	NA	0	NA A	A A A	NA A	NA
Colorado	no info.	37	no info.	no info.	2,690,000	no info.	no info.	no info.	no info.
Kansas	low	105	105	0	10,091,000	10,091,000 10,091,000	1,009,100 0.25	0.25	no info.
Montana	no info.	48	no info.	no info.	1,417,000	no info.	no info.	no info.	no info.
Nebraska	none	47	no info.	0	1,800,000	no info.	no info.	no info.	no info.
North Dakota	low	27	12	0	70,000	31,100	3,100	0.1	no info.
Oklahoma	Iow	77	40	5	5,400,000	2,800,000	280,000	1.2	no info.
Wyoming	1 8	i	-	-	230,000	230,000	2,300	0.0	no info.

Acres in infested area = (# counties where RWAs detected / # counties where crop planted) x acres planted

The Constants C1 and C2 are:

C2	0.00	0.025	0.05	0.10
C1	0.00	0.10	0.50	1.00
Rating	none	low	moderate	severe

Table 2. Economic impact of the Greenbug on irrigated winter wheat in reporting states, 1997-1998 growing season.

S C		_	profiles where		Acros	Acros in	Arros	% viold	Acros
S		3	Coulines Wilele.		אכועמ	בו משכע	משכע	/o yiein	いからなっ
2	severity				Planted	infested	infested	loss	treated
	rating					area			
		Crop	Greenbugs	Economic					
		Planted	Planted Detected	Losses					
California	AN	0	AN	NA	0	NA	AN	NA AN	Y Y
Colorado	no info.	26	no info.	no info.	160,000	no info.	no info.	no info.	no info.
2	low	43	43	0	000,609	000,609	006'09	0.25	no info.
Montana	no info.	39	no info.	no info.	33,000	no info.	no info.	no info.	no info.
Nebraska	none	18	no info.	0	100,000	no info.	no info.	no info.	no info.
North Dakota n	none	0	AN	NA	0	NA AN	AN	NA	no info.
Oklahoma	low	14	4	no info.	120,000	34,000	3,400	0.07	no info.
Wyoming	no info.	no info.	no info.	no info.	no info.	no info.	no info.	no info.	no info.

Acres in infested area = (# counties where RWAs detected / # counties where crop planted) x acres planted

The Constants C1 and C2 are:

Rating	C1	C2
none	0.00	0.00
low	0.10	0.025
moderate	0.50	0.05
severe	1.00	0.10

Table 3. Economic impact of the Greenbug on spring wheat in reporting states, 1997-1998 growing season.

State Infestation Counties where: Acres Acres in Acres % yiel	Infestation	O	Counties where:		Acres	Acres in	Acres	% yield	Acres
	severity				Planted	infested	infested	loss	treated
	rating					area			
		Crop	Greenbugs	Economic					
		Planted	Planted Detected	Losses					
California	low	33	12	0	000'069	250,000	25,000	0.09	no info.
Colorado	no info.	17	no info.	no info.	70,000	no info.	no info.	no info.	no info.
Kansas	NA	0	NA	NA	0	NA	NA	NA	NA A
Montana	no info.	52	no info.	no info.	4,640,000	no info.	no info.	no info.	no info.
Nebraska	NA	0	NA	NA	0	NA	NA	NA	NA AN
North Dakota	none	53	23	0	8,800,000	0	0	0	no info.
Oklahoma	NA	0	NA	NA	0	NA	NA	NA	Z Y Y
Wyoming	no info.	no info.	no info.	no info.	no info.	no info.	NA	NA	NA

Acres in infested area = (# counties where RWAs detected / # counties where crop planted) x acres planted

The Constants C1 and C2 are:

Rating	none	low	moderate	severe
C1	0.00	0.10	0.50	1.00
C2	0.00	0.025	0.05	0.10

Table 4. Economic impact of the Greenbug on barley in reporting states, 1997-1998 growing season.

Table 1: Economic migration of contrast of many migrations and many many many many many many many many	ما الما الما الما الما الما الما الما ا	000000	10 BB2110	10 do 1 11 601	מינים היתים	100000000000000000000000000000000000000	and composition		
State	Infestation	O	Counties where:		Acres	Acres in	Acres	% yield	Acres
	severity				Planted	infested	infested	ssoj	treated
	rating					area			
		Crop	Greenbugs	Economic					
		Planted	Detected	Losses					
California	low	33	12	0	220,000	80,000	8,000	60.0	no info.
Colorado	no info.	27	no info.	no info.	95,000	no info.	no info.	no info.	no info.
Kansas	low	no info.	no info.	0	10,000	no info.	no info.	no info.	no info.
Montana	no info.	54	no info.	no info.	1,300,000	no info.	no info.	no info.	no info.
Nebraska	none	8	no info.	0	10,000	no info.	no info.	no info.	no info.
North Dakota	none	53	23	0	2,400,000	no info.	no info.	no info.	no info.
Oklahoma	NA	0	NA	NA	0	NA	NA	NA	NA
Wyoming	no info.	no info.	no info.	no info.	105,000	no info.	no info.	no info.	no info.

Acres in infested area = (# counties where RWAs detected / # counties where

crop planted) x acres planted

The Constants C1 and C2 are:

חום ססווסומונים סדומ סדום	C2	0.00	0.025	0.05	0.10
2	C1	0.00	0.10	0.50	1.00
2000 000	Rating	none	low	moderate	Severe

Table 5. Economic impact of the Greenbug on sorghum in reporting states, 1997-1998 growing season.

State         Infestation severity severity         Counties where:         Acres in severity         Acres in rested infested infest	6				-					-
severity         Planted         Planted         Planted         Planted         Detected         Losses         NA	0)	Infestation	Ö	ounties where	· · ·	Acres	Acres in	Acres	% yield	Acres
rating         Crop         Greenbugs         Economic         Analy           NA         Detected         Losses         NA         NA           NA         0         NA         NA         NA           Iow         105         105         0         3,500,000         87,500           Iow         105         105         0         3,500,000         87,500           Iow         0         NA         NA         NA         NA           Iota         NA         NA         NA         NA           Iow         62         45         5         490,000         355,000         36,000           Iow         NA         NA         NA         NA         NA         NA		severity				Planted	infested	infested	loss	treated
NA         Crop         Greenbugs         Economic         NA		rating					area			
NA         Detected         Losses         NA         NA           no info.         21         no info.         290,000         no info.         no info.           low         105         0         3,500,000         3,500,000         87,500           none         35         no info.         0         NA         NA         NA           none         35         no info.         0         NA         NA         NA           ota         NA         0         NA         NA         NA         NA           now         62         45         5         490,000         355,000         36,000           NA         NA         NA         NA         NA         NA         NA			Crop	Greenbugs	Economic					
NA         NA         NA         0         NA         NA           no info.         21         no info.         290,000         no info.         no info.           low         105         0         3,500,000         3,500,000         87,500           none         35         no info.         0         NA         NA         NA           none         35         no info.         0         NA         NA         NA           nota         0         NA         0         NA         NA           now         62         45         5         490,000         355,000         36,000           NA         0         NA         NA         NA         NA         NA			Planted	Detected	Losses					
no info.         21         no info.         no info.         290,000         no info.         no info.           low         105         0         3,500,000         3,500,000         87,500           NA         0         NA         NA         NA           none         35         no info.         0         900,000         no info.           ota         NA         0         NA         NA           in low         62         45         5         490,000         355,000         36,000           NA         0         NA         NA         NA         NA         NA	fornia	NA	0	NA	NA	0	NA	NA	NA	NA NA
low         105         105         0         3,500,000         3,500,000         87,500           NA         0         NA         0         NA         NA         NA           none         35         no info.         0         900,000         no info.         no info.           ota         NA         0         NA         NA         NA         NA           I low         62         45         5         490,000         355,000         36,000           NA         0         NA         NA         NA         NA	orado	no info.	21	no info.	no info.	290,000	no info.	no info.	no info.	no info.
NA         NA<	Isas	low	105	105	0	3,500,000	3,500,000	87,500	2.5	no info.
none         35         no info.         0         900,000         no info.         no info.           ota         NA         NA         0         NA         NA           I low         62         45         5         490,000         355,000         36,000           NA         0         NA         NA         NA         NA         NA	ntana	NA	0	NA	NA	0	NA	AN	NA	NA
Otal         NA         NA         0         NA         NA           I         Iow         62         45         5         490,000         355,000         36,000           I	oraska	none	35	no info.	0	000,006	no info.	no info.	no info.	no info.
low 62 45 5 490,000 355,000 36,000 NA	th Dakota	AN	0	NA	NA	0	NA	NA	NA	NA
NA O NA O NA NA NA NA NA	ahoma	low	62	45	5	490,000	355,000	36,000	0.18	no info.
	oming	NA	0	NA	NA	0	NA	NA	NA	NA

### Notes:

Acres in infested area = (# counties where RWAs detected / # counties where crop planted) x acres planted

The Constants C1 and C2 are:

C2	0.00	0.025	0.05	0.10
C1	0.00	0.10	0.50	1.00
Rating	none	low	moderate	severe



